DESCRIPTION

"Reservoir for a water treatment device and manufacturing method of said reservoir"

[0001]. The present invention refers to a tank for a water-treatment device, for example a device for decalcifying the water supplied by an aqueduct.

[0002]. Devices for treating the water supplied by a water system, for example of an aqueduct, are becoming increasingly popular, both in the field of domestic and industrial use.

[0003]. For example, more and more often, homes or condominiums are equipped with such a type of device, for example to decalcify the water, or in any case, alter its physical-chemical characteristics and make it more suitable for uses, for example as drinking water.

[0004]. Similarly, the water supplied by the water network or taken from rivers, lakes or from the sea, is treated in industry before being used in a particular production cycle to make it more suitable for this cycle.

[0005]. The water-treatment devices are inserted upstream of the domestic or industrial distribution network, and generally comprise a tank that is connected to the water network.

[0006]. During device operation, these tanks contain water at a high pressure compared with the

characteristics of the distribution network downstream of the device, and a mass of organic resins, whose composition is connected with the specific treatment, to which the water is subjected.

[0007]. In any case, said tanks are made of a material that is suitable for contact with the water, which may be used as drinking water.

[0008]. To cope with the elevated working pressure or satisfy the difficult conditions to which these tanks are subjected during the tests foreseen by regulations in this field, said tanks have an internal coating and a cover for reinforcement.

[0009]. It is known how the most critical area in the sector for resistance to working pressure or testing is the opening area of the tank, which is generally fitted with connection devices, such as a thread, for connection to a device valve.

[0010]. The object of the present invention is to create a tank for a water-treatment device fitted with an opening that has such characteristics to increase resistance to elevated working pressure or tank testing.

[0011]. This object is achieved by means of a tank made according to claim 1. The claims depending on this describe possible variations. According to the present invention, the tank can be made in accordance with the

construction method according to claim 18. Claims depending on this describe variations of implementation of said method.

[0012]. The characteristics and advantages of the tank according to the present invention will appear evident from the description reported below of an example of embodiment, given as an example, which is not limiting, in accordance with the accompanying drawings, wherein:

[0013]. - figure 1 shows a partially sectioned perspective view of a tank according to the present invention;

[0014]. - figure 2 represents a sectioned surface view of an opening area of the tank in figure 1, and

[0015]. - figure 3 shows a sectioned surface view of an insert of the tank in figure 1.

[0016]. In accordance with the accompanying drawings, a tank for a water-treatment device is globally indicated with reference numeral 1.

[0017]. The tank 1 comprises an internal coating 2, which extends prevalently along a longitudinal X-X axis, between a closed bottom and an opening area 6 with an opening 8 to the atmosphere.

[0018]. In a variation of embodiment, said bottom can be made according to the characteristics illustrated below for said opening area 6.

[0019]. In the description reported below, reference will be made to the terms "longitudinal" and "radial", to be understood respectively as referring to the direction of said longitudinal X-X axis and a lying down direction on a perpendicular plane to said axis, cutting said axis.

[0020]. The coating 2 comprises a wall of coating, between said bottom and said opening area, which is basically cylindrical, and surmounted by a cap wall 9a that culminates in a neck 9b, marking said opening 8, and projecting longitudinally from said cap wall 9a.

[0021]. The coating 2 is made of a coating material that is compatible with water, in other words, a material that does not release fragments and cause processes of chemical deterioration, or release unwanted, harmful or similar substances, when it comes into contact with water, even after lengthy periods of time.

[0022]. For example, said coating is made of a plastic resin, for example high-density polyethylene (HDPE) for alimentary purposes.

[0023]. The tank 1 also comprises a hollow insert 10, connected to said coating 2 on a level with the opening 8 of this.

[0024]. The insert 10 comprises an annular wall 12, for connecting said insert 10 to the coating 2, and a collar 14, connected to the annular wall 12, projecting

externally from the coating 2, marking the opening 8.

[0025]. The annular wall 12 preferably comprises gripping devices suitable for making a notch for connection between the coating 2 and the insert 10.

[0026]. In a preferred embodiment, said gripping devices comprise at least one annular projection 16 that projects radially from said annular wall.

[0027]. According to a preferred embodiment, said gripping devices comprise a variety of annular projections 16, spaced out longitudinally between each other and projecting radially from the annular wall.

[0028]. The collar 14 preferably projects radially in relation to the annular wall 12 of the insert, defining a touching crown 18, an annular lateral surface 20 and a free crown 22.

[0029]. The insert preferably presents an annular groove 24 on a level with said touching crown 18, which is suitable for holding a sealing ring 26.

[0030]. Once the insert is connected to the coating 2, the touching crown 18 appears as the counterpart of the neck 9b of the coating 2.

[0031]. According to an additional preferred embodiment, the insert presents an annular indentation 28 on a level with said lateral surface 20.

[0032]. Internally, along said longitudinal X-X axis of

the coating, from the outside towards the inside of the coating, the insert 10 presents a threaded part 30, which is suitable for connecting the tank 1 to a valve of the water-treatment device and an entrance part 32, flaring towards the inside of the coating 2.

[0033]. The insert 10 is preferably made of a material that is harder than the coating 2 material.

[0034]. For example, the insert 10 is made of a plastic resin, such as high-density polyethylene (HDPE) for alimentary purposes, for example with glass fibres.

[0035]. Subsequently, the tank 1 comprises an external cover 40, which covers the coating, at least in part, since it is in close contact with this.

[0036]. The cover 40 preferably comprises at least one bundle of fibres 42 that is wrapped tightly several times around the coating 2.

[0037]. For example, said bundle comprises glass fibres.

[0038]. Subsequently, said cover 40, comprises a matrix in which said bundle of fibres is buried.

[0039]. Said matrix is preferably an isophthalic neopentilic resin, with the optional addition of colorant and filaments in glass fibre.

[0040]. The cover 40 comprises a portion of covering 50 covering the collar 14 at least partially, which is in

close contact with this, thus strengthening the connection between said insert 10 and said coating 2.

[0041]. In particular, the portion of covering 50 penetrates into the annular indentation 28 of the insert 10, at least partially, further strengthening the connection between said insert and coating 2.

[0042]. The tank 1 can be made according to a construction method, which envisages making the insert 10 separately from the coating 2, for example for pressing.

[0043]. Said method also foresees a phase of production for the coating 2 connected to the insert 10.

[0044]. Said phase can be carried out in a press for blowing, with a support for the insert 10, a relatively mobile die and a counter-punch, devices for blowing air into the cavity between the die and counter-punch in closed configuration and devices for feeding a soft tube between the die and counter-punch in open configuration.

[0045]. In a variation of implementation of the method, said coating production phase can be carried out in a rotational press.

[0046]. The insert 10 is positioned on the support between the die and the counter-punch; the sealing ring is inserted into the relative annular groove.

[0047]. There is also a tube made of said coating material between the die and counter-punch, which is kept

at a temperature suitable for keeping said coating material soft, in other words, in a physical state suitable for expansion for blowing and/or rotational.

[0048]. The die and counter-punch are brought together, closing up.

[0049]. On closing up, the die and counter-punch, cause the coating material to position itself around the annular wall 12 of the insert 10 held on the support.

[0050]. By injecting blowing air inside the tube, between the closed die and counter-punch, said tube expands against the walls of the die and counter-punch until it takes the shape of the coating.

[0051]. Said coating material penetrates between said annual projections of the annular wall 12 making the mechanical connection between the insert and the coating.

[0052]. Subsequently, the touching crown 18 of the insert 10 presents itself in contact with the neck 9b of the coating 2, the sealing ring being thus held in the relative annular groove of the collar.

[0053]. The coating connected to the insert is removed by opening the press, in other words, by distancing the die from the counter-punch.

[0054]. Subsequently, a covering phase is carried out for the coating and the insert.

[0055]. In other words, the covering 40 is made around

the coating 2, repeatedly wrapping said bundle of fibres buried in said matrix tightly.

[0056]. In particular, a part of said bundle of fibres is wrapped several times tightly around the collar 14, making said portion of covering 42.

[0057]. Even more particularly, at the start of said covering phase, the bundle of fibres is wrapped several times around the collar 14 of the insert 10 and then continuously around the rest of the coating 2.

[0058]. Unusually, according to the present invention, the tank presents a high resistance opening, suitable for resisting high working pressure or tank testing.

[0059]. In other words, according to the present invention, the tank presents a longer working life and improved features of seal and resistance in time.

[0060]. Particularly advantageously, the insert results strongly connected to the coating.

[0061]. In order to have a thread that is sufficiently resistant to high pressure, in other words to prevent the thread from tearing, the insert is made of a harder material than that of the coating material.

[0062]. This discontinuity of the mechanical features between the insert and the coating results in a tendency for the insert and coating to separate, which could lead to escapes or losses forming during operation.

[0063]. In other words, said gripping devices create a notch suitable for holding the insert in place on the coating, but the circumferential projections of the annular wall and the coating material tend to come unstuck, creating preferential breather channels.

[0064]. Advantageously, the portion of covering of the collar and the covering of the coating create a continual barrier, which prevents external leaks or losses.

[0065]. Also advantageously, said matrix in which the bundle of fibres is buried, contributes to creating said continual barrier.

[0066]. According to an additional advantageous feature, the portion of covering, which envelops the collar holds the insert and, in particular, it holds said collar in contact with said neck of the coating.

[0067]. Advantageously, the sealing ring, positioned between said gripping devices of the annular wall and said portion of covering, prevents external leaks or losses.

[0068]. According to an even greater advantageous feature, the covering increases the resistance of the coating also on a level with the cylindrical wall and said cap wall.

[0069]. The bundle of fibres wraps the coating tightly, and the matrix in which it is buried, contributes to

creating a compact layer, which opposes the action of the high pressure inside the coating, which is in a state of traction over the whole of the coating.

[0070]. In other words, nonetheless, said bundle of fibres reacts in a way that can be compared to the metal rings associated with the walls of wooden barrels, in a uniform manner over the whole of the coating, guaranteeing the numerous aforesaid additional advantages.

[0071]. It is clear that an expert on the subject can make alterations and variations to the above described tank in order to resolve unforeseen and specific requirements, which are moreover all included in the field of protection, as defined by the following claims.